2815

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Patent Application of)
)
Yukiyasu SUGANO et al.)
)
Serial No. 09/478,812)
)
Filed: January 7, 2000)
)
For: Process For Producing Thin)
Film Semiconductor Device And)
Laser Irradiation Apparatus)

Group Art Unit: 2815

Examiner: E. Lee

COMMISSIONER FOR PATENTS
Washington, D.C. 20231

Sir:

Transmitted herewith is an amendment in the above-identified application.

☒ No additional fee is required.

The fee has been calculated as shown below

CLAIMS AS AMENDED

	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NO. PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDITIONAL FEE
TOTAL CLAIMS	73	MINUS	74	=0	x $9 $18	$0.00
INDEP. CLAIMS	31	MINUS	31	=0	x$40 $80	$0.00
Fee for Multiple Dependent Claims $130/$260						
			TOTAL ADDITIONAL FEE FOR THIS AMEND-MENT		$0.00	

- If the entry in Column 2 is less than the entry in Column 4,
- write "0" in Column 5.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, write "20" in this space.

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, write "3" in this space.

☐ A Letter to the Official Draftsperson is enclosed.

☐ A Change of Address is enclosed.

☐ Charge $_____ to Deposit Account No. 18-0013. A duplicate copy of this sheet is enclosed.

☒ Any prior general authorization to charge an issue fee under 37 C.F.R. 1.18 to Deposit Account No. 18-0013 is hereby revoked. The Commissioner is hereby authorized to charge any additional fees under 37 CFR 1.16 and 1.17 which may be required during the entire pendency of this application, or to credit any overpayment, to Deposit Account No. 18-0013. A duplicate copy of this sheet is enclosed.

☐ Charge $_____ to Deposit Account No. 18-0013 to cover the Extension fee for response within _____ month(s).

☒ Applicant's undersigned attorney may be reached by telephone in our Washington D.C. Office at

(202) 955-3750.

All correspondence should be directed to our below listed address.

Date: September 19, 2001

Ronald P. Kananen
Reg. No. 24,104

RADER, FISHMAN & GRAUER PLLC
1233 20TH Street, NW
Suite 501
Washington, DC 20036
Telephone: (202) 955-3750
Facsimile: (202) 955-3751

Customer No. 23353

SON-1718 BOX AF

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#11/Response 9/26/01

In the Patent Application of

Yukiyasu SUGANO et al.

Serial No. 09/478,812

Filed: January 7, 2000

For: Process For Producing Thin Film Semiconductor Device and Laser Irradiation Apparatus

Group Art Unit: 2815

Examiner: E. Lee

RESPONSE TO FINAL OFFICE ACTION

Commissioner of Patents
BOX AF
Washington, DC 20231

Sir:

This is a full and timely response to the final Official Action mailed June 21, 2001. Reexamination and reconsideration in light of the above amendments and the following remarks are courteously requested.

None of the pending claims has been amended. Thus, claims 11 to 12, 17 to 18, 27 to 28, 39 to 40, 53 to 54, 63 to 65, and 73 to 74 are currently pending for the Examiner's consideration.

In the outstanding Office Action, the Examiner rejected claims 11, 17, 27, 39, 53, 63, and 73 under 35 U.S.C. § 103(a) as being anticipated by U.S. Patent No. 5,352,291, issued to Zhang et al., ("Zhang"). The Examiner also rejected claims 12, 18, 28, 40, 54, 65, and 74 under 35 U.S.C. § 103(a) as being unpatentable over Zhang in view of U.S. Patent No.

5,798,744 issued to Tanaka et al. ("Tanaka"). These rejections are respectfully traversed.

As conceded by the Examiner, the limitation in each of the claims regarding the height of the layers of amorphous polysilicon film is not taught or suggested by either the Tanaka or the Zhang patent. The Zhang process is usable for making polycrystalline silicon film from an amorphous semiconductor film which is not disclosed throughout the specification to be any smaller than 100 nm. The Examiner asserts that it would have been an obvious matter of design choice to have a significantly smaller amorphous silicon layer, as such a change merely constitutes a change in size. To this point, Applicant disagrees with the Examiner.

The reason that a significantly thinner amorphous semiconductor layer than that which is disclosed by Zhang is more than a mere change in size lies in the manner by which the claims establish that the semiconductor device is produced. It is understood that the process limitations in the claims are not given patentable weight to the claims unless the process limitations somehow ascribe structure to the product made by the process. However, it is also important to note that the process steps explain the significance of other product limitations. In the present case, the smaller thickness of the amorphous semiconductor layer is more significant than a mere change in size because,

as the claims recite, the irradiation that the layer is subjected to is a bulk irradiation that is conducted in such a manner that a cross sectional shape of an energy beam is adjusted with respect to the region by a single shot irradiation.

Because the cross sectional shape of the energy beam is pertinent to the thickness of the semiconductor layer, the process within the product claim, while not yielding additional patentable weight to the claims, do exhibit a rationale that supports the argument that a person of ordinary skill in the art would not find motivation in the Zhang patent, or the Tanaka patent for that matter, for arriving at the claimed product. There is no teaching or suggestion in Zhang or the remaining cited prior art references that the Zhang process could be applied to a thinner amorphous film. In fact, the present specification clearly teaches that the problems associated with the Zhang process (merely eliminating hydrogen from amorphous semiconductor films using heat without laser processing) are overcome by the presently claimed invention. Further, Zhang fails to teach or suggest that the cross sectional shape of an energy beam should be adjusted with respect to an irradiated region, e.g., a significantly thinner region than that disclosed by Zhang.

The examiner has the initial burden of demonstrating that all the claimed features of the invention are taught by the

prior art. In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Where the examiner relies on a single reference under § 103, as is the case with the limitation of the presently claimed 30 to 80 nm amorphous semiconductor layer, it is insufficient to merely state that it would be obvious, or a mere matter of design choice, to modify the disclosure of that reference to include the features of the claimed invention. In re Mills, 16 USPQ2d 1430, 1432 (Fed. Cir. 1990). "To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. (emphasis added). Accord. M.P.E.P. § 706.02(j).

The Board of Patent Appeals and Interferences refuses to uphold rejections ~~in which the~~ examiner simply alleges that the relevant feature of a claimed invention is a mere "design choice." Such a statement, in the words of the Board, "is a conclusion, rather than a reason." Ex parte Garrett, 1986 Pat. App. LEXIS 8, 4 (BPAI 1986). "To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effects of a hindsight syndrome." In re Fine, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988) (quoting W.L. Gore & Assoc. v. Garlock, Inc., 220 USPQ 303, 312-13 (Fed. Cir. 1983)). Because the evidence set forth above weighs strongly against the

limitation of a 30 to 80 nm amorphous semiconductor layer being a mere matter of design choice, the rejections of the pending claims should be overcome.

It is briefly pointed out that the Tanaka patent fails to make up for the limitations discussed above, to which the teachings of the Zhang patent are deficient. The Tanaka patent is only relied upon for display device features, and makes no mention of a thickness of an amorphous semiconductor layer that is crystallized.

For the foregoing reasons, all the claims now pending in the present application are believed to be clearly patentable over the prior art of record. Accordingly, favorable reconsideration of the claims in light of the above remarks is courteously solicited. If the Examiner has any comments or suggestions that could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the below-listed number.

Respectfully submitted,

DATE: September 19, 2001

Ronald P. Kananen
Registration No. 24,104

RADER, FISHMAN & GRAUER, PLLC
Lion Building
1233 20th Street, N.W.
Washington, D.C. 20036
Tel: (202) 955-3750
Fax: (202) 955-3751
Customer No.: 23353